WE CLAIM:

1. A system for electrodepositing a conductive material on a surface of a wafer, the system comprising:

an anode;

a mask having upper and lower surfaces, the mask comprising a plurality of openings extending between the upper and lower surfaces and being supported between the anode and the surface of the wafer;

Sub A6

a conductive mesh positioned below the upper surface of the mask such that the plurality of openings of the mask defines a plurality of active regions of the conductive mesh wherein the conductive mesh is connected to a first power input; and

a liquid electrolyte flowing through the openings of the mask and through the active regions of the conductive mesh so as to contact the surface of the wafer.

2. The system of Claim 1, wherein the conductive mesh is attached to the lower surface of the mask.

3. The system of Claim 1, wherein the conductive mesh is in the mask and is positioned between the upper surface and the lower surface of the mask.

4. The system of Claim 1, wherein the conductive mesh comprises a first area and a second area.

5. The system of Claim 4, wherein the first area is connected to the first power input.

6. The system of Claim 5, wherein the second area is connected to a second power input.

Sub A6

7. An anode assembly useable together with a cathode assembly in a device which can provide deposition of conductive material from an electrolyte onto a surface of a semiconductor substrate comprising:

an anode which can be contacted by the electrolyte during deposition of said conductive material,

a conductive element permitting electrolyte flow therethrough, and

a mask lying over the conductive element and having openings permitting electrolyte flow therethrough, said openings defining active regions of the conductive element by which a rate of conductive material deposition onto said surface can be varied.

8. The anode assembly of Claim 7, wherein said conductive element is a conductive mesh.

9. The anode assembly of Claim 7, wherein said conductive element includes a plurality of electrically isolated sections.

10. The anode assembly of Claim 9, wherein said conductive element includes at least one isolation member separating the electrically isolated sections.

11. The anode assembly of Claim 9, wherein said conductive element includes at least one gap separating the electrically isolated sections.

Sub A6 Cont'd

12. The anode assembly of Claim 9, wherein the electrically isolated sections can be connected to separate control power sources.

13. The anode assembly of Claim 7, wherein the conductive element is sandwiched between top and bottom mask portions which together define said mask.

14. The anode assembly of Claim 7, wherein the conductive element is placed under a lower surface of said mask.

15. The anode assembly of Claim 9, wherein one of said electrically isolated sections circumferentially surrounds another of said electrically isolated sections.

16. The anode assembly of Claim 15, wherein the electrically isolated sections are irregularly shaped.

17. The anode assembly of Claim 15, wherein said one of said electrically isolated sections is ring shaped.

18. The anode assembly of Claim 17, wherein the other of said electrically isolated sections is disc shaped.

19. The anode assembly of Claim 9, wherein said electrically isolated sections define adjacent strips.

Sub A6, Cont'd

20. An apparatus which can control thickness uniformity during deposition of conductive material from an electrolyte onto a surface of a semiconductor substrate comprising:

an anode which can be contacted by the electrolyte during deposition of said conductive material,

a cathode assembly including a carrier adapted to carry the substrate for movement during said deposition,

a conductive element permitting electrolyte flow therethrough,

a mask lying over the conductive element and having openings permitting electrolyte flow therethrough, said openings defining active regions of the conductive element by which a rate of conductive material deposition onto said surface can be varied, and

a power source which can provide a potential between said anode and said cathode assembly so as to produce said deposition.

Sub A6> Cont'd

21. The apparatus of Claim 20, wherein said conductive element is a conductive mesh.

22. The apparatus of Claim 20, wherein said conductive element includes a plurality of electrically isolated sections.

23. The apparatus of Claim 22, wherein said conductive element includes at least one isolation member separating the electrically isolated sections.

24. The apparatus of Claim 22, wherein said conductive element includes at least one gap separating the electrically isolated sections.

25. The apparatus of Claim 22, wherein the electrically isolated sections can be connected to separate control power sources.

26. The apparatus of Claim 20, wherein the conductive element is sandwiched between top and bottom mask portions which together define said mask.

27. The apparatus of Claim 20, wherein the conductive element is placed under a lower surface of said mask.

10095035.051501

28. The apparatus of Claim 22, wherein one of said electrically isolated sections circumferentially surrounds another of said electrically isolated sections.

29. The apparatus of Claim 28, wherein the electrically isolated sections are irregularly shaped.

Sub A6 cont'd

30. The apparatus of Claim 28, wherein said one of said electrically isolated sections is ring shaped.

31. The apparatus of Claim 30, wherein the other of said electrically isolated sections is disc shaped.

32. The apparatus of Claim 22, wherein said electrically isolated sections define adjacent strips.

33. The apparatus of Claim 22, and further comprising at least one control power source which can supply a voltage to at least one of said electrically isolated sections to vary said rate of conductive material deposition onto a region of said surface.

34. The apparatus of Claim 33, wherein said rate is increased.

35. The apparatus of Claim 33, wherein said rate is decreased.

36. The apparatus of Claim 22, wherein said power source can additionally supply a voltage to at least one of said electrically isolated sections to vary said rate of conductive material deposition onto a region of said surface.

37. The apparatus of Claim 36, wherein said rate is increased.

Sub A6 cont'd

38. The apparatus of Claim 36, wherein said rate is decreased.

39. The apparatus of Claim 36, and further comprising at least one additional power source which can supply an additional voltage to another of said electrically isolated sections.

40. The apparatus of Claim 20, and further comprising at least one control power source which can supply a voltage to said conductive element to vary said rate of conductive material deposition.

41. The apparatus of Claim 39, wherein said rate is increased.

42. The apparatus of Claim 39, wherein said rate is decreased.

43. The apparatus of Claim 20, wherein said power source can supply a voltage to said conductive element to vary said rate of conductive material deposition.

Sub A6 Cont'd

44. The apparatus of Claim 43, wherein said rate is increased.

45. The apparatus of Claim 43, wherein said rate is decreased.

46. A process for controlling thickness uniformity during deposition of conductive material from an electrolyte onto a surface of a semiconductor substrate comprising:

contacting an anode with the electrolyte,

providing a supply of the electrolyte to said surface through a conductive element and through openings in a mask lying over the conductive element which define active regions of the conductive element,

providing a potential between said anode and said surface so as to produce said deposition, and

supplying a voltage to said conductive element to vary a rate of conductive material deposition.

47. The process of Claim 46, wherein said conductive element is a conductive mesh.

48. The process of Claim 46, wherein the conductive element is placed under a lower surface of said mask.

49. The process of Claim 46, and further comprising polishing said conductive material as said deposition occurs.

50. A process for controlling thickness uniformity during deposition of conductive material from an electrolyte onto a surface of a semiconductor substrate comprising:

contacting an anode with the electrolyte,

providing a supply of the electrolyte to said surface through a plurality of electrically isolated sections of a conductive element and through openings in a mask lying over the conductive element which define active regions of the conductive element,

providing a potential between said anode and said surface so as to produce said deposition, and

supplying a voltage to at least one of said electrically isolated sections to vary a rate of conductive material deposition onto a region of said surface.

51. The process of Claim 50, wherein said conductive element is a conductive mesh.

52. The process of Claim 50, wherein said conductive element includes at least one isolation member separating the electrically isolated sections.

53. The process of Claim 50, wherein said conductive element includes at least one gap separating the electrically isolated sections.

A

54. The process of Claim 50, wherein said rate is increased.

55. The process of Claim 50, wherein said rate is decreased.

56. The process of Claim 50, and further comprising polishing said material as said deposition occurs.

57. An apparatus which can control thickness uniformity during electroetching of conductive material from a surface of a semiconductor substrate comprising:

Sub A6 Cont'd

an anode which can be contacted by an electrolyte during electroetching of said conductive material,

a cathode assembly including a carrier adapted to carry the substrate for movement during said electroetching,

a conductive element permitting electrolyte flow therethrough,

a mask lying over the conductive element and having openings permitting electrolyte flow therethrough, said openings defining active regions of the conductive element by which a rate of conductive material electroetching from said surface can be varied, and

a power source which can provide a potential between said anode and said cathode assembly so as to produce said electroetching.

Sub A6) Cont'd

58. The apparatus of Claim 57, wherein said conductive element is a conductive mesh.

59. The apparatus of Claim 57, wherein said conductive element includes a plurality of electrically isolated sections.

60. The apparatus of Claim 59, wherein said conductive element includes at least one isolation member separating the electrically isolated sections.

61. The apparatus of Claim 59, wherein said conductive element includes at least one gap separating the electrically isolated sections.

62. A process for establishing ~~a relationship~~ between deposition currents in active regions of a conductive element

09655056.051501

and thicknesses of conductive material deposited from an electrolyte onto a surface of a semiconductor substrate comprising:

contacting an anode with the electrolyte,

providing a supply of the electrolyte to said surface through the conductive element and through openings in a mask lying over the conductive element which define the active regions of the conductive element,

providing a potential between said anode and said surface so as to produce deposition of the conductive material onto said surface,

supplying a voltage to said conductive element,

determining a deposition current at each opening,

obtaining conductive material thickness measurements, and

comparing the deposition currents determined to the conductive material thickness measurements.

09855059.051501

add A7